



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification: A61F 2/44, A61F 2/46	A3	(11) International Publication Number: WO 00/42954 (43) International Publication Date: 27 July 2000 (27.07.2000)
<p>(21) International Application Number: PCT/US00/01766</p> <p>(22) International Filing Date: 24 January 2000 (24.01.2000)</p> <p>(30) Priority Data: 09/328,283 08 June 1999 (08.06.1999) US 60/116,852 22 January 1999 (22.01.1999) US</p> <p>(60) Parent Application or Grant OSTEOTECH, INC. [/]; O. SCARBOROUGH, Nelson, L. [/]; O. BOYLE, John, W. [/]; O. DILWORTH, Peter, G. ; O.</p>		Published
<p>(54) Title: INTERVERTEBRAL IMPLANT (54) Titre: IMPLANT INTERVERTEBRAL</p> <p>(57) Abstract</p> <p>An intervertebral implant having a composite wedge/dowel configuration is provided. The intervertebral implant includes a central body portion and a pair of radially extending wings. The radially extending wings can be tapered from a first end of the implant to the second end of the implant along an axis parallel to the longitudinal axis of the central body portion. Alternately, the radially extending wings can be tapered along an axis transverse to the longitudinal axis of the cylindrical body portion or along any other axis between parallel and transverse to the longitudinal axis. A throughbore or plurality of throughbores extend from a top surface of the implant through the implant to a bottom surface of the implant. The implant may be formed from a cortical ring cut from the diaphysis of a long bone by milling the top and bottom surfaces of the cortical ring to form the substantially central body portion and the tapered radially extending wings. The cortical ring is milled such that the intramedullary canal of the cortical ring defines a throughbore in the central body portion of the implant. The sidewalls of the implant may be machined to form a substantially rectangular shape or the implant can be left to have a substantially circular configuration. Alternately, the implant may be formed of any biocompatible material having the requisite strength requirements via any known process, i.e., molding.</p> <p>(57) Abrégé</p> <p>L'invention concerne un implant intervertébral présentant une configuration de cale/tenon. Cet implant intervertébral comprend un élément central et deux ailes qui s'étendent dans une direction radiale. Ces ailes radiales peuvent s'effiler progressivement entre la première extrémité de l'implant et la second extrémité de l'implant le long d'un axe parallèle à l'axe longitudinal de l'élément central. Dans un autre mode d'exécution, les ailes radiales peuvent s'effiler le long d'un axe transversal à l'axe longitudinal de l'élément cylindrique ou le long d'un autre axe intermédiaire entre l'axe parallèle et l'axe transversal par rapport à l'axe longitudinal. L'implant est traversé par un ou plusieurs passages s'étendant entre la surface supérieure et la surface inférieure de l'implant. L'implant peut être formé d'un anneau cortical qu'on découpe dans la diaphyse d'un os long en fraisant les surfaces supérieure et inférieure de l'anneau cortical de manière à former l'élément sensiblement central et les ailes effilées radiales. On fraise l'anneau cortical de telle manière que le canal intramédullaire de l'anneau cortical définisse un passage traversant dans l'élément central de l'implant. On peut travailler les parois latérales de l'implant de manière à leur donner une forme sensiblement rectangulaire, ou bien on peut conserver la forme sensiblement circulaire de l'implant. Dans une forme d'exécution différente, l'implant peut être produit dans n'importe quel matériau biocompatible conforme aux exigences en matière de résistance, au moyen de n'importe quel procédé connu, p. ex. moulage.</p>		

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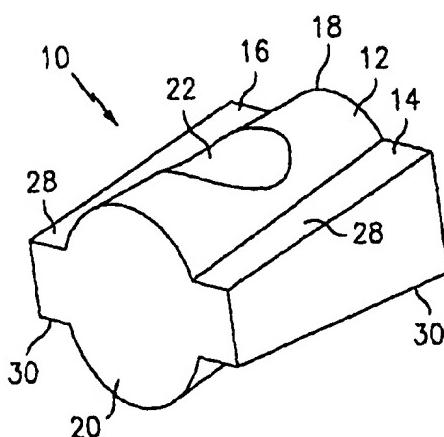
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60/116,852 22 January 1999 (22.01.1999) US
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- (71) Applicant: **OSTEOTECH, INC.** [US/US]; 51 James Way, Eatontown, NJ 07724 (US).
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- (74) Agents: **DILWORTH, Peter, G.** et al.; Dilworth & Barrese, 333 Earle Ovington Boulevard, Uniondale, NY 11553 (US).
- (81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
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- Published:
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **INTERVERTEBRAL IMPLANT**



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The sidewalls of the implant may be machined to form a substantially rectangular shape or the implant can be left to have a substantially circular configuration. Alternately, the implant may be formed of any biocompatible material having the requisite strength requirements via any known process, i.e., molding.

(57) Abstract: An intervertebral implant having a composite wedge/dowel configuration is provided. The intervertebral implant includes a central body portion and a pair of radially extending wings. The radially extending wings can be tapered from a first end of the implant to the second end of the implant along an axis parallel to the longitudinal axis of the central body portion. Alternately, the radially extending wings can be tapered along an axis transverse to the longitudinal axis of the cylindrical body portion or along any other axis between parallel and transverse to the longitudinal axis. A throughbore or plurality of throughbores extend from a top surface of the implant through the implant to a bottom surface of the implant. The implant may be formed from a cortical ring cut from the diaphysis of a long bone by milling the top and bottom surfaces of the cortical ring to form the substantially central body portion and the tapered radially extending wings. The cortical ring is milled such that the intramedullary canal of the cortical ring defines a throughbore in the central body portion of the implant.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/01766

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A61F2/44 A61F2/46		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 A61F		
Documentation searched other than minimum documentation to the extend that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 683 394 A (RINNER JAMES A) 4 November 1997 (1997-11-04) figures 1,3,4 column 2, line 54 -column 3, line 27 column 4, line 46 - line 50	1,10, 15-18,23
A	---	19-22
X	FR 2 742 652 A (COLORADO) 27 June 1997 (1997-06-27) figures 1-3 page 7, line 15 -page 8, line 3 claims 1-11	1,2,10
Y	---	6,7
Y	US 5 814 084 A (GRIVAS NICHOLAS E ET AL) 29 September 1998 (1998-09-29) figures 1-38 claims 1,16	6,7
	-/-	
<input checked="" type="checkbox"/>	Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/> Patent family members are listed in annex.
* Special categories of cited documents :		
'A' document defining the general state of the art which is not considered to be of particular relevance		
'E' earlier document but published on or after the international filing date		
'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)		
'O' document referring to an oral disclosure, use, exhibition or other means		
'P' document published prior to the international filing date but later than the priority date claimed		
'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention		
'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone		
'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.		
'&' document member of the same patent family		
Date of the actual completion of the international search	Date of mailing of the international search report	
18 July 2000	26.07.2000	
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 851 epo nl, Fax: (+31-70) 340-3016	Authorized officer Mary, C	

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/01766

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	FR 2 769 827 A (SDM) 23 April 1999 (1999-04-23) figures 5-8 page 4, line 31 -page 5, line 27 -----	1,4,5,10
E	US 6 045 580 A (MORRIS JOHN W ET AL) 4 April 2000 (2000-04-04) figures 18-30 column 4, line 37 - line 47 column 7, line 22 -column 8, line 51 -----	1
Y	-----	28,29,32
P,X	WO 99 38461 A (SYNTHES AG ;SYNTHES USA (US)) 5 August 1999 (1999-08-05) figures 1-6 page 2, paragraph 2 page 3, paragraph 3 page 6, paragraph 2 -page 7, paragraph 2 page 8, paragraph 1 page 9, paragraph 1 - paragraph 3 page 10, paragraph 2 - paragraph 3 claims 1,2,5,15,22-25 -----	24,25, 30,31,34
Y	-----	26-29,32
P,Y	WO 99 09914 A (CARTER KEVIN C ;GROOMS JAMIE M (US); SANDER TOM (US); DULEBOHN DAV) 4 March 1999 (1999-03-04) figures 1A-D,9,10A-16 page 9, line 14 -page 10, line 27 claims 1-14 claims 17-30 -----	26,27
A	US 4 950 296 A (MCINTYRE JONATHAN L) 21 August 1990 (1990-08-21) column 2, line 21 -column 3, line 22 figures 3,4 -----	24

INTERNATIONAL SEARCH REPORT

I. national application No.
PCT/US 00/01766

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-23

An intervertebral implant comprising a central body and at least one wing extending radially outwardly from the central body portion.

2. Claims: 24-34

A method for forming an intervertebral implant from the diaphysis or metaphysis of a long bone comprising a cutting and a milling step.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No	
PCT/US 00/01766	

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5683394	A 04-11-1997	NONE		
FR 2742652	A 27-06-1997	EP 0871419 A	21-10-1998	
		WO 9723174 A	03-07-1997	
US 5814084	A 29-09-1998	AU 704228 B	15-04-1999	
		AU 1700597 A	11-08-1997	
		CA 2243152 A	24-07-1997	
		CZ 9802206 A	16-06-1999	
		EP 0876129 A	11-11-1998	
		HU 9902187 A	29-11-1999	
		JP 2000503231 T	21-03-2000	
		PL 328226 A	18-01-1999	
		WO 9725945 A	24-07-1997	
FR 2769827	A 23-04-1999	WO 9920208 A	29-04-1999	
US 6045580	A 04-04-2000	US 5895426 A	20-04-1999	
WO 9938461	A 05-08-1999	NONE		
WO 9909914	A 04-03-1999	AU 8922998 A	16-03-1999	
		EP 1009338 A	21-06-2000	
US 4950296	A 21-08-1990	NONE		